

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

A DEVICE FOR RECORDING HUMIDITY IN AMONG LEAVES OF PLANTS

By Theo. E. Bronson, Division of Truck Crop and Garden Insects,
Bureau of Entomology and Plant Quarantine,
U. S. Department of Agriculture

An instrument was developed for the purpose of recording relative humidity close to the ground in the foliage of pea and alfalfa plants where the use of a regular hygrograph would not be feasible. The sensitive element of this device is enclosed in a long piece of brass tubing which may easily be placed in practically any type of foliage.

Construction.--A Friez soil thermograph was used as the basis for this new device. The diaphragm, cable, and bulb were removed. A $\frac{3}{8}$ -inch hole was drilled just beneath the bracket which supported the pen arm in the rear end of the case. A piece of brass tubing 18 inches long by $\frac{5}{16}$ inch in diameter (fig. 1, A) which contains the sensitive element was fastened directly over this hole by means of a heavy brass flange (fig. 1, B) soldered to the end of the tube. The flange was fastened to the case with three $\frac{1}{8}$ -inch studs. Thirty-six $\frac{3}{16}$ -inch holes were drilled in two rows in the lower half of the tube to allow for air circulation and for drainage. The sensitive element is a strip of rattan $\frac{1}{16}$ inch in diameter and 16 inches in length. Fine brass wire was wound around each end of this rattan and used for attachment. The outer end was fastened to a piece of $\frac{1}{8}$ -inch threaded brass rod. This rod projected through a bushing at the end of the brass tube, and final adjustment was secured at this end by means of a nut. The wire on the inner end of the rattan was fastened directly to a very short lever (fig. 2, A) which indirectly operates the pen arm. An additional lever (fig. 2, B) and a very light spring (fig. 2, C) furnish just enough tension to take the slack from the rattan element and connection.

After the machine was built, it was calibrated in constant-humidity rooms at the Forest Products Laboratory of the U. S. Department of Agriculture at Madison, Wisconsin.

This combination of rattan in a brass tube has been used for some time at the Forest Products Laboratory for determining the percentage of moisture in forest duff.

If a soil thermograph is available, the entire cost of the changes to make this recorder should not be over \$10.

Explanation of Illustrations

Figure 1.--Hygrograph for use in foliage (adapted from the Friez soil thermograph). A, brass tubing which contains the sensitive rattan element; B, flange for attaching brass tubing to box.

Figure 2.--Mechanism of hygrograph used in foliage. A, short lever attached to rattan by means of fine wire; B, spring lever; C, coil spring.

Fig.1

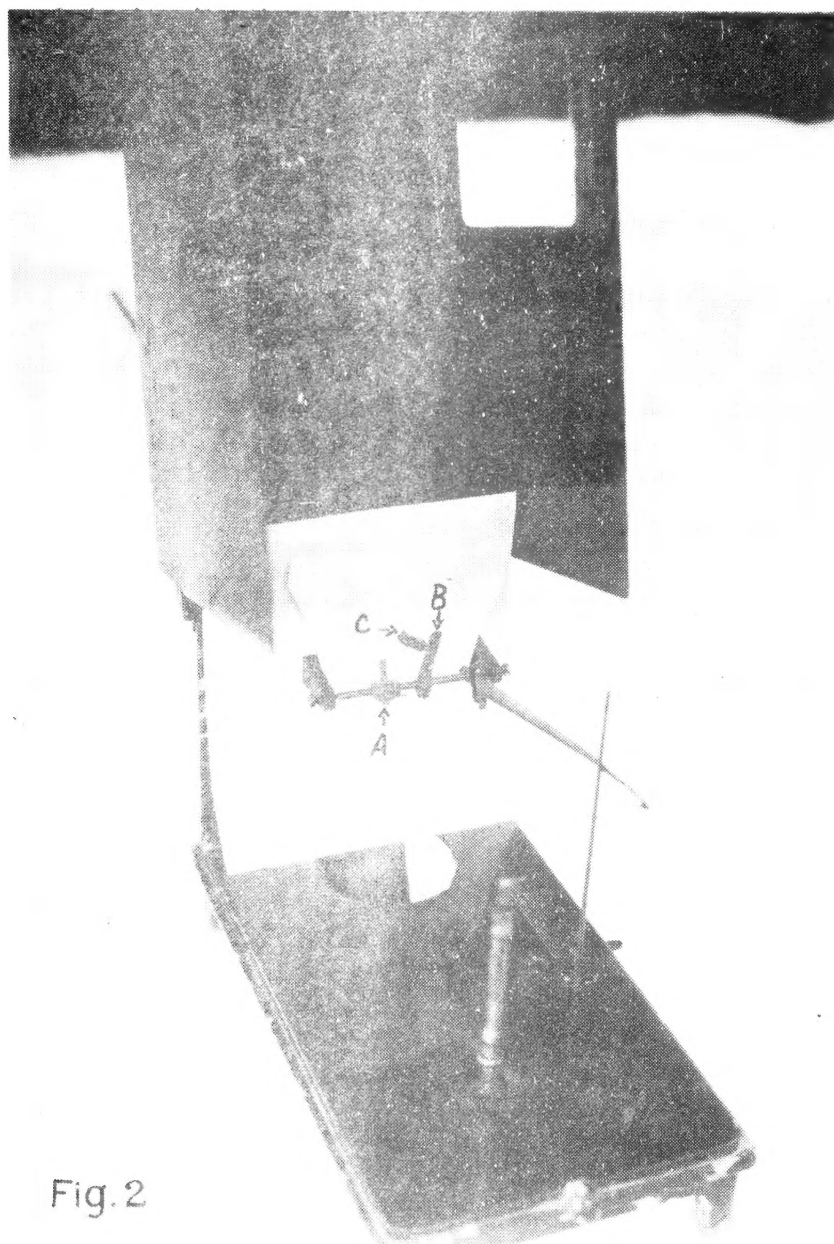
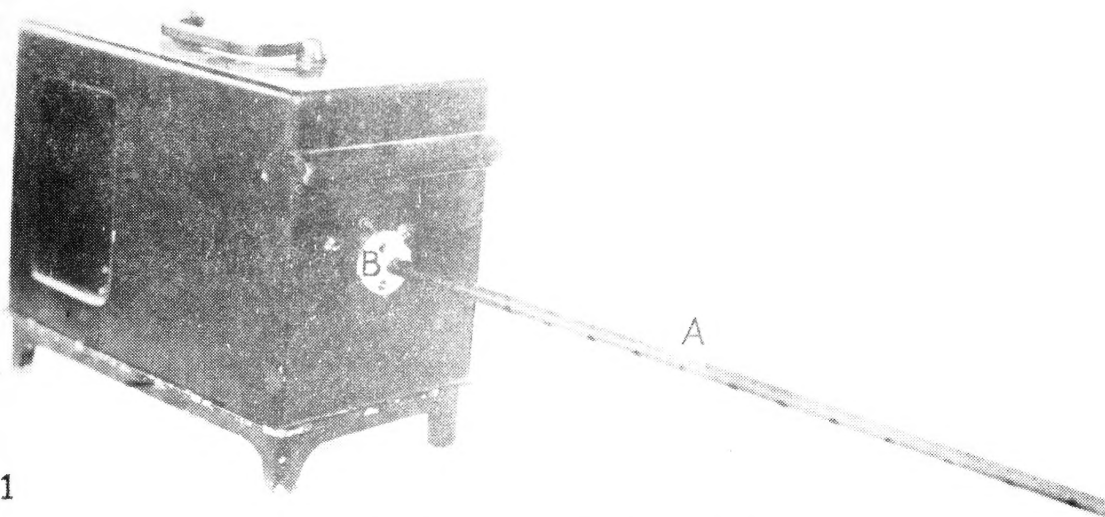


Fig.2

